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TRADITIONAL LANDSCAPE AND MASS TOURISM IN THE ALPS*

MARY L. BARKER

THE continued expansion of mass tourism is having serious negative effects in several mountain regions of the world. As ski resorts in western North America penetrate the sensitive alpine terrain both in and outside national parks and forests, conflicts emerge between the preservation of a natural heritage and the desire to expand resort facilities.¹ In some developing countries, revenue-generating trekking has come into conflict with established landuse patterns and has subtly disrupted cultural patterns.² But nowhere have the effects been more pronounced than in the European Alps, where an enormously successful investment in tourism now strains the carrying capacity of both the landscape and the social fabric. In this article I examine the changes effected by mass tourism on the landscape, the economy, and the traditional culture of the Alps. The responses of numerous communities in the Alps to tourist-related changes in the economy, landuse, and cultural diversity provide a fund of experience that suggests options for other mountain regions.

The origin of the existing patterns of income inequities, depopulation of isolated valleys, and land abandonment lies in the accelerated decline of the Alpine agricultural economy after the onset of the industrial revolution. Depopulation was not a new phenomenon, because a shift to extensive agricultural practices began in the late Middle Ages and led to a peak of land clearance in the fourteenth century.³ The confiscation of large monastic estates in the western Alps after the French Revolution resulted in significant land abandonment and a pattern of state ownership that established the distinctive, centralized approach to French landuse planning.

The development of railroad links spurred rural depopulation throughout the Alps in the nineteenth century, particularly in the French and Italian portions where the rural population halved between mid-nineteenth and mid-

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¹ Larry W. Price, *Mountains and Man: A Study of Process and Environment* (Berkeley: University of California Press, 1981), pp. 429–441; and Barry Sadler, *National Parks and surrounding lands, in The Canadian National Parks: Today and Tomorrow, Conference 11: Ten Years Later, Studies in Land Use History and Landscape Change No. 7* (edited by J. G. Nelson, R. D. Needham, S. H. Nelson, and R. C. Scace; Waterloo: University of Waterloo, Faculty of Environmental Studies, 1979), pp. 269–292.

² Mary L. Barker, *National Parks, Conservation, and Agrarian Reform in Peru*, *Geographical Review*, Vol. 70, 1980, pp. 1–18; and Toni Hagen, *Nepal: Königreich am Himalaya* (Bern: Kümmerly & Frey, 3rd edition, 1980), pp. 245–264.

³ Elizabeth Lichtenberger, *Das Bergbauernproblem in den österreichischen Alpen—Perioden und Entsidlung*, *Erkundung*, Vol. 19, 1964, pp. 39–57, reference on pp. 40–41.

twentieth centuries.⁴ Permanent settlements were abandoned in the southern Swiss canton of Ticino, and there was a 30 to 50 percent decrease in the number of farms in southern Bavaria.⁵ Land abandonment and the shift to an extensive grazing economy, which peaked in the late nineteenth century, resulted in significant landscape changes. For example, natural regrowth and reforestation increased the forest cover of the French Alps from 19 percent in 1879 to 33 percent in 1980.⁶ Despite the economic impetus provided by the first phase of Alpine tourism, depopulation and accompanying landscape changes persisted well into the twentieth century.

Recreational landuse had several predecessors. In eastern Austria, for example, it resulted from conversion of farmholdings to hunting estates. The imperial and royal hunting reserves in the northern calcareous Alps of Salzburg and Bavaria were probably the earliest extensive alienations of land for recreation. Among the first tourists in the early nineteenth century was a wealthy foreign elite, particularly the English, which found it fashionable to relax amid attractive lakeside and mountain scenery. Mountain climbing became an established sport at Chamonix and Zermatt and in the Engadine, the Dolomites, and the Ötz valley of Tirol. Guidebooks were required as rambling through the Alps attracted an ever-expanding following: the first Baedeker volume on Switzerland was published in 1844 and one on Bavaria and Tirol appeared in 1855.⁷

Mountaineering associations were formed as the sport outgrew the initial English enthusiasts who climbed with local guides. The first Alpine Club was founded in London in 1857, the Austrian Alpine Club in 1862, and the German Alpine Club in 1869.⁸ In a few years, other associations were created to promote a broad appreciation of the scenic attractions of the Alps and to encourage scientific research.

The broadened interest developed with the second wave of tourism that was associated with the arrival of railroads in the Alps in the 1870s. A small number of exclusive resorts such as Montreux and Merano arose to cater to a wealthy clientele. By the end of the nineteenth century it had become fashionable to visit thermal spas at St. Moritz in Switzerland, St. Gervais in France, and Badgastein and Bad Ischl in Austria. In the 1870s, the hydroelectrical potential of the Alps was tapped to provide services for tourists. For example, the first Swiss hydroelectrical plant began operations in 1878 to provide lighting for a hotel-restaurant in St. Moritz.⁹

Summer tourism dominated until the early decades of the twentieth century. A significant winter season developed in the 1920s and the early 1930s, although the first ski course had been opened on Arlberg as early as 1904 and

⁴ Ludwig Löhr, *Bergbauernwirtschaft im Alpenraum* (Graz: Stock Verlag, 1971), p. 22.

⁵ Josef Birkenhauer, *Die Alpen* (Munich: Ferdinand Schöningh, 1980), p. 70.

⁶ Annick Douguédroit, *Reafforestation in the French Southern Alps*, *Mountain Research and Development*, Vol. 1, 1981, pp. 245–252, reference on p. 245.

⁷ Jacky Herbin, *Le tourisme au Tyrol autrichien* (2 vols.: Grenoble: Institut de Géographie Alpine, 1980) Vol. 1, p. 189.

⁸ Karl A. Sinnhuber, *Recreation in the Mountains*, in *Studies in the Geography of Tourism and Recreation*, *Wiener Geographische Schriften Vol. 51/52*, Vienna, 1978, pp. 59–84, reference on p. 69.

⁹ *Energy Generation and Distribution* (Zurich: Swiss Office for the Development of Trade, 1980), p. 12.

mechanical lifts were installed near Merano before World War I. The first winter Olympics were held at Chamonix in 1924; ski facilities were introduced at Innsbruck and Kitzbühel in Austria; and the French ski resorts of Alpe d'Huez, Tignes, and Val d'Isère were established. By 1924, 14 percent of the overnight-tourist stays in Tirol occurred in the winter season.¹⁰ Winter tourism increased to 44 percent of the annual total by 1933, but the worldwide depression led to a major decline in both summer and winter tourism throughout the Alps. With that decline the era of grand hotels catering to an exclusive clientele ended. In these early phases of tourism the distribution of economic benefits tended to be highly localized, because development was concentrated in a few resorts along the railroad corridors. Seasonal employment in hotels and as guides supplemented farm incomes, and in a few places such as the upper Rhone valley in Switzerland economic benefits spread to tributary valleys where small resorts and climbing centers, Zermatt, for example, had been established.

By the early 1930s mountain agriculture was increasingly marginal in isolated valleys, and land abandonment continued as peasants migrated in search of employment to the industrial centers of the Alpine forelands. Rural depopulation was most acute in the western and southern Alps and least severe in Austria where the area of alpine hay meadows and pastures declined by only 14 percent between 1931 and 1971.¹¹ North-facing slopes, steep mountainsides, and isolated holdings were the first to be abandoned, and in some cases high-lying permanent communities became seasonal settlements that were occupied only during the brief summer when cattle or sheep were grazed on the alpine pastures. Elsewhere the idling of land resulted in an increase of forest cover and unproductive scrub vegetation as well as in a substantial increase in the number of red deer where hunting restrictions were enforced. During the past hundred years, the population in the Italian Alps below 1,000-meters elevation has increased, but stagnated or decreased in areas between 1,000 and 1,750 meters.¹² The increasingly marginal economic position of Alpine agriculture was also reflected in the proportion of the population employed in the primary sector of Alto Adige, which, mirroring similar changes throughout the Alps, fell from 38 percent in 1951 to 17 percent in 1971.¹³

Although remote valleys, particularly in the southern and western Alps, continue to suffer economic decline, mass tourism since the late 1950s has served as a catalyst for repopulation and economic revitalization in parts of Switzerland and in western Austria (Fig. 1). But even in these regions growth has been concentrated around the tourist centers that are along key transportation routes. In the eastern Swiss canton of Graubünden, small, nontourist-oriented communities lost as much as 30 to 80 percent of their population between 1960 and 1970, while the fashionable ski resorts of Flims and St. Moritz grew by 35 percent and 49 percent respectively.¹⁴

¹⁰ Herbin, footnote 7 above, p. 207.

¹¹ Ludwig Löhr, *Die bewegenden Kräfte des Strukturwandels im österreichischen Bergland*, Proceedings of Symposium Intrapraevent, Bad Ischl, Austria, 1980, pp. 225–234, reference on p. 232.

¹² L. V. Patella and R. Perari, *Lo sviluppo socio-economico negli Alpi italiana*, in *Die Zukunft der Alpen*, *Alpen-Institut Schriftenreihe* Vol. 4, Munich, 1975, pp. 44–58, reference on p. 53.

¹³ *Südtirol Handbuch* (Bolzano: Autonomous Province of Alto Adige-Südtirol, 1980), p. 134.

¹⁴ Diether Bernt and Gernot Ruhl, *Grundsatzfragen der Belastungsproblematik im Alpenraum*, *Berichte zur Raumforschung und Raumplanung*, Vol. 22, 1978, pp. 12–26, reference on p. 16.

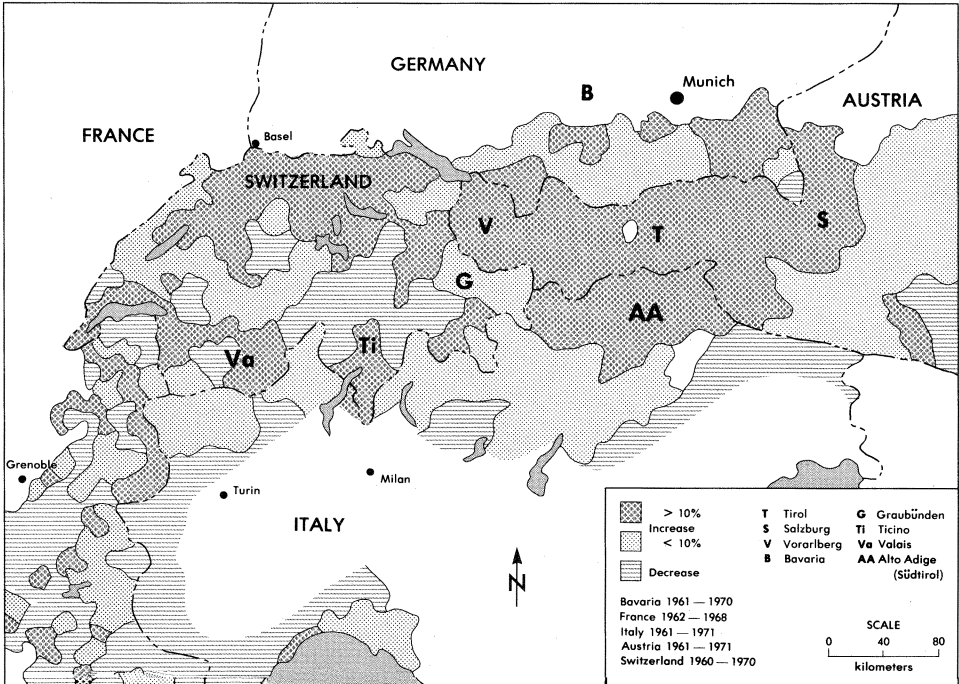


FIG. 1—Regional population changes in the Alps. Source: Simplified from Walter Danz and Hans-Rudolf Henz, *Integrierte Berggebietsentwicklung, Alpen-Institut Synthesebericht 2066–52*, Munich, 1972, p. 25.

Disparities in income continue to spread as the mountain farmers face increased competition from agricultural production in lowland Europe that capitalizes on mechanization, well-developed transportation networks, large urban markets, and production incentives of the Common Market. Income gradients are visible in the Alps. The farmers of Tirol and Salzburg earn 50 percent less than the farmers of Graubünden.¹⁵ Differences between the economic viability of mountain and valley farms in these areas have intensified—a serious trend in countries such as Austria and Switzerland where 25 percent and 35 percent of the farmers are mountain peasants. This trend is widespread despite a complex array of country and provincial price supports and direct payments that favor the mountain farmers. Income supplements from nonfarming activities such as the provision of tourist accommodations, logging, and employment in public-works projects are insufficient to make up the balance. The mountain farmers are caught in a cost-price squeeze as the price of farm inputs rises at a faster rate than that of agricultural outputs. Agricultural earnings of the Austrian mountain peasants rose only by 10 percent between 1967 and 1977 in comparison to 300 percent for lowland farmers.¹⁶

¹⁵ Berichte über die wirtschaftliche und soziale Lage der Land- und Forstwirtschaft, Arbeitsgemeinschaft Alpenländer, Feldkirch, Austria, June, 1981, p. 11.

¹⁶ Löhr, footnote 11 above, p. 228; and R. Schnitzer, *Die Zukunft der Berggebiete und der Berglandschaft, Der Alm- und Bergbauern*, Vol. 28, 1978, pp. 287–401.

One choice in this economic situation is to consolidate farmholdings in large operations, as is occurring in Tirol where the number of livestock farms decreased 40 percent between 1950 and 1978.¹⁷ Alternatively, farm incomes can be supplemented by daily or seasonal commuting to nonfarm employment, but this practice generally means heavier work loads for the remaining family members. However, the mountain farm is kept intact, and money brought to the community in the form of wages helps the local economy. Employment in construction at the growing number of large hydroelectrical projects proved a viable, though temporary, solution.

Involvement of many communities in the new mass-tourism boom began when families supplemented farm incomes by renting guest accommodations in the farmhouses. Other persons invested in hotels but continued their farmholdings with additional family or hired labor. Combined mountain farming and tourist accommodations result in working hours in excess of sixty to seventy hours a week for an individual. The heaviest burden is borne by the wife and older children when the husband commutes to a regular job.

Because the tourism boom favors the less remote areas, out-migration of the young from the isolated valleys results in a predominance of older persons in the remaining population, a higher per capita cost of maintaining essential services, a decline in the productive capacity of the land, and a loss of social stability. Mountain communities thus have become more vulnerable to externally induced change. Abandonment of some traditional farming practices such as the regular mowing of steep-sloped hay meadows also leads to increased snow-avalanche hazards.¹⁸

THE GROWTH OF MASS TOURISM

The substantial increase in disposable income and automobile ownership in western Europe during the 1950s resulted in the boom of mass tourism in the Alpine countries. This new phase of tourism differed from earlier waves on two major counts. A small group of elite tourists was no longer the principal clientele, and development was not concentrated in a few resorts. Initially the post-World War II expansion of tourism focused on traditional centers but then rapidly dispersed as new ski resorts, apartment and second-home complexes, hotels, pensions, and campsites were constructed to serve the needs of the day and weekend tourists from cities such as Munich and Milan on the Alpine forelands and of the vacationers from more distant urban centers. During 1980, 40-million vacationers and 60-million day or weekend visitors stayed in the Alps.¹⁹ The most popular destinations were Austria with 118-million overnight stays and Switzerland with 75.7-million overnight stays.²⁰

The period of maximum expansion of mass tourism varied regionally. The rapid growth in the eastern Alps during the 1950s was followed by lower, but

¹⁷ *Berichte über die Lage der Landwirtschaft 1978/79* (Innsbruck: Government of Tirol, 1980), p. 88.

¹⁸ Herbert Aulitzky, *Endangered Alpine Regions and Disaster Prevention Measures, Nature and Environment Series Vol. 6*, Council of Europe, Strasbourg, 1974.

¹⁹ Walter Danz, *Die Alpen und der moderne Tourismus*, in *Das grosse ADAC Alpenbuch* (Munich: ADAC Verlag, 1980), pp. 204–209, reference on p. 207.

²⁰ *Bericht zur Lage der Fremdenverkehrswirtschaft in Tirol im Jahre 1980* (Innsbruck: Government of Tirol, 1980), pp. 14 and 24; and *Tiroler Tageszeitung*, February 2, 1981, p. 12.

still exponential rates between 1960 and 1970. Summer decreases occurred in 1973 and 1974 as a consequence of cutbacks in oil production and price increases by OPEC. The number of overnight stays in Tirol rose fivefold between 1950 and 1960, or an annual growth rate of 17.6 percent (Fig. 2). During the 1960s the rate dropped to 8.3 percent annually and declined even further to 3.8

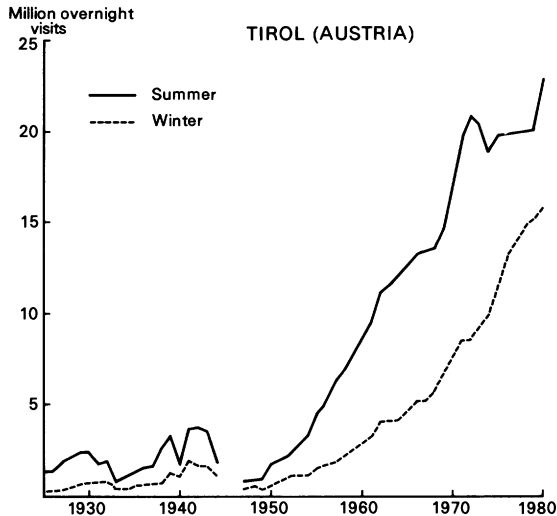


FIG. 2.—Overnight tourist visits to Tirol, 1926–1980. Sources: Compiled from data in Herbin, text footnote 7, p. 216; and Bericht zur Lage, text footnote 20, p. 10.

percent in the period immediately after the oil crisis of late 1973. At that time the severity of the effect on the summer season was masked by the continued growth of winter tourism. Summer tourism did not return to pre-1973 levels until 1979.²¹ The revaluation of the Swiss franc in 1971 led to a slump in the number of foreign visitors; the decline continued as the effects of the oil-price rise and the economic recession were experienced. A low point was reached in the mid-1970s, and stagnation in the Swiss hotel-accommodation sector continues, although the tourist industry shows some signs of recovery.

In terms of the proportion of total overnight stays, the summer season dominates, but the most rapid growth rates have been associated with winter sports. The number of ski lifts in Switzerland increased fifteenfold between 1950 and 1975.²² Old agricultural communities such as Saas-Fee in the Valais Alps, which developed small summer resorts and climbing centers in the 1920s and invested in ski facilities in the 1950s, have experienced faster growth rates in the winter than in the summer since the early 1960s (Fig. 3).²³ New ski resorts developed in the French Alps shortly after World War II, but the boom to capitalize on *l'or blanc* began with the construction of large *stations intégrées* such as La Plagne in 1963 at high elevations. Overnight visits to the French Alps between 1955

²¹ Bericht zur Lage, footnote 20 above, p. 6.

²² Das Schweizerische Tourismuskonzept (Bern: Beratende Kommission für Fremdenverkehr des Bundesrates, 1980), p. 22.

²³ Albert C. Jöhr, Saas-Fee und seine Bahnen—vom Gletscherdorf zum Kurort (Saas-Fee, Switz.: Verlag Luftseilbahnen Saas-Fee AG, 1978).

and 1977 increased at an average annual rate of 14.6 percent in the winter season, but only 5 percent in the summer season.²⁴

The length of the tourist season has become a crucial factor as communities continue to invest in costly infrastructure to participate in the increasingly fierce competition for visitors. Resorts that depend on one short peak summer

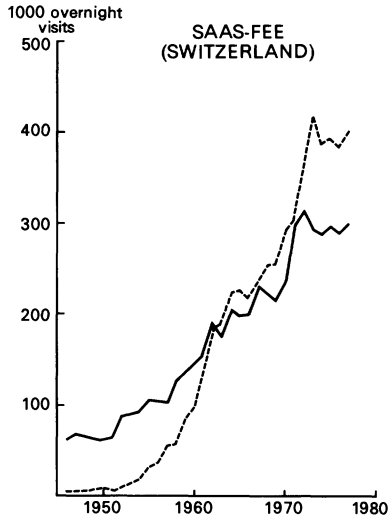


FIG. 3.—Overnight tourist visits to Saas-Fee, Switzerland, 1946–1977. *Source:* Compiled from data in Jöhr, text footnote 23, p. 71.

(July–September) or winter (January–March) season have difficulty in defraying capital costs for hotels or ski lifts. The local population has been unable to earn sufficient income to maintain itself during the rest of the year, and the brief period of tourism puts demands on the local work force that may require supplementary laborers. One solution is to use the facilities during a second tourist season, for example, by developing summer skiing on glaciers high above the valley communities or by promoting the summer attractions of winter resorts. The promotional literature for Les Arcs, a new station intégrée at 1,800 meters in the French Alps, stresses fine arts, golf, and tennis for the summer months. Resorts that have developed a second season are now attempting to lengthen the period by attracting visitors during the off-season. Although promotional campaigns with slogans such as “Wanderbares Österreich” (“Hikable Austria”) used in 1979 have had a large degree of success in lengthening the summer season, unreliable weather conditions preclude total effectiveness of similar campaigns for the winter season.

There appears to be a limit beyond which it is uneconomical to invest in additional tourist accommodations. The number of tourist beds in Austria increased to 670,000 in 1979, and the occupancy rates ranged from 37.9 percent in February to 60.2 percent in August. The winter-occupancy rate in Switzerland was similar, but the summer rate was only 48.3 percent, and the number

²⁴ Jacky Herbin, *Le tourisme au Tyrol: une valeur d'exemple pour les Alpes françaises?*, *Revue de Géographie Alpine*, Vol. 68, 1980, pp. 83–96, reference on p. 89.

of guest beds declined between 1977 and 1979.²⁵ Some tourist regions such as Kitzbühel where the average occupancy rate was 26.4 percent in 1979 appear to have reached a saturation point.²⁶ One indication of gross regional imbalance is the fact that more than half of the total overnight stays in Tirol occurred in only thirty-three communities, eight of them in the Kitzbühel area.²⁷ This pattern of a juxtaposition of overdeveloped and underutilized areas is characteristic of the Alps.

Communities that have become dependent on tourist revenues are vulnerable to changes in European travel trends, because foreign guests are a growing majority in all Alpine regions except Bavaria and the French Alps: 52 percent in Switzerland, 75 percent in Austria, and 85 percent in Alto Adige. Foreign visitors contribute less than a quarter of all tourist-overnight stays in the French Alps. Regional preferences are apparent among the European travelers. For example, Austrians prefer Italy rather than Switzerland which has a similar alpine environment, while French tourists visit Italy rather than German-speaking regions.²⁸ In Alto Adige, where for historical-political reasons 63 percent of the population is German-speaking, much tourism expansion in recent decades was based on non-Italian visitors with 83 percent of all overnight stays made by West Germans in 1979.²⁹ In Tirol, non-Austrians—three-quarters of them from West Germany—accounted for 88 percent of the winter guests and 94 percent of the summer visitors.³⁰

Austria has become a more popular destination than Switzerland for many West Germans, because of the easy access from the large urban centers in southern Germany, low prices, and active efforts to promote tourist services. There is an increased concern about the ultimate limit of continued expansion of tourism and the ramifications of changes in preference or purchasing power among the international clientele. Countries such as Austria, where tourist receipts were equivalent to 21 percent of total exports in recent years, are vulnerable to a redirection of tourist flows and to currency fluctuations that could inhibit international travel.³¹ After the decline of the West German mark in 1980, such concerns intensified. The consequences seem more serious for hotels and owners of private accommodations than for foreign-owned vacation houses and the commercial sector that caters to the flow of day visitors. Private quarters have increased more rapidly than the traditional hotel sector in Switzerland and the eastern Alps since the early 1960s. By the late 1970s more than one-third of the total overnight stays by tourists in Tirol and Alto Adige was spent in private quarters.³² Many mountain farmers use such rentals as a way to

²⁵ Das Schweizerische Tourismuskonzept, footnote 22 above, p. 21; and Tourism Policy and International Tourism in OECD Countries (Paris: Organization for Economic Co-operation and Development, 1980), pp. 66 and 174.

²⁶ 27 Principles for the Development of Tourism in Mountain Regions, *Local and Regional Authorities in Europe Study Series No. 19*, Council of Europe, Strasbourg, 1979, p. 82.

²⁷ Helmuth Barnick, Alpine Raumordnung—ein wichtiger Teil der Tiroler Raumordnung, *Berichte zur Raumpforschung und Raumplanung*, Vol. 24, 1980, pp. 3–7, reference on p. 5.

²⁸ Tourism Policy, footnote 25 above, pp. 81, 92, 95, 103, and 125.

²⁹ Südtirol Handbuch, footnote 13 above, p. 11.

³⁰ Bericht zur Lage, footnote 20 above, p. 11.

³¹ Tourism Policy, footnote 25 above, p. 56.

³² Adolf Leidlmair, Tirol auf dem Wege von Agrar- zur Erholungslandschaft, *Mitteilungen der Österreichischen Geographischen Gesellschaft*, Vol. 20, 1978, pp. 38–53, reference on p. 48.

participate in the tourist boom. There are striking regional variations in the extent of this participation because of differences in accessibility. On average, one-third of all mountain-farming operations in Tirol gain supplementary income from accommodation rentals, but the proportion is much greater in areas near major tourist centers. The provincial governments of Tirol, Alto Adige, and Bavaria gave strong incentives and promoted internationally the theme "vacation on a farm." The current recession exposed the risk of overinvestment and reliance on an ever-increasing demand. Mountain farmers in some less-developed areas of Alto Adige, for example, now face financial difficulties in meeting mortgage commitments for accommodations for tourists who do not arrive in the expected numbers.³³

Vacation houses have become a popular alternative to hotels or accommodations in private dwellings. Vacation houses range from owned or rented, with or without hotel service, to converted farmhouses and huts in mountain pastures. Vacation houses are not a new phenomenon in the Alps; in the nineteenth century wealthy residents of cities such as Vienna bought country houses in areas that were accessible by railroad. The pattern changed after World War II when weekend houses in rural settings close to the major cities of the Alpine forelands became popular. By the 1960s the supply of empty or available farmhouses was exhausted, and a surge of apartment-type construction was based on increased per capita income. The number of second homes doubled during the 1960s and reached a peak in the early 1970s, by which time a pattern of regional concentration had emerged: in the Salzkammergut, in the cantons of Ticino and Valais, around Lake Geneva, and in parts of the Italian and French Alps. Vacation homes became a significant component in some long-established tourist areas. The proportion of second homes to total accommodations ranged from 20 to 25 percent in Kitzbühel and Seefeld to 50 or more percent in French ski resorts such as Courchevel and l'Alpe d'Huez.³⁴ More than 40 percent of the total buildings in some communities of Alto Adige are vacation houses, three-quarters of them foreign owned, chiefly by Bavarians.³⁵

Some communities encouraged the construction of vacation houses because they increased the tax base, made use of empty or abandoned farmhouses, and made additional revenue available to farmers who sold unprofitable land and used the cash to modernize their agricultural operations. In the French Alps vacation housing was seen as a means to revitalize depopulated areas and to increase the profitability of established resorts. A number of problems soon emerged in the vacation-house boom (Fig. 4). When second-home owners moved in permanently after retirement, demands on local services increased. The use of vacation houses is limited to a brief period of the year, but minimal services must be provided throughout the year. The additional cost of providing the required infrastructure is borne by the resident population because taxation of vacation properties does not generate sufficient revenue to cover the cost. Economic benefits to local businesses are not as large as expected because second-home owners often bring their own supplies. Increased prop-

³³ *Tiroler Tageszeitung*, July 8, 1981, p. 5.

³⁴ Herbin, footnote 7 above, p. 300.

³⁵ Beatrix Pardeller-Raffeiner, *Die Freizeit- und Zweitwohnsitze in Südtirol* (unpublished Ph.D. dissertation, Institute of Geography, University of Innsbruck, Innsbruck, 1980), p. 38.



FIG. 4.—Privately owned vacation chalets and apartments at Montgenèvre, a small ski resort at 1,854 meters in the French Alps. The style of the apartment buildings reinforces the suburban appearance of the landscape.

erty values hinder local farmers who may want to consolidate or enlarge holdings and often preclude the purchase of farms by many young persons.³⁶ In areas where the development of vacation residences is uncontrolled, the traditional appearance of a settlement is lost and replaced by a suburban-appearing landscape (Fig. 5). Because of the brief period of use, vacation communities are deserted for long intervals.

EFFECTS OF TOURISM

Based on the ratio of guest beds to permanent population, an index of tourism intensity illustrates two distinctive forms of tourist-related effects on the Alpine landscape that are particularly visible near tourist centers. For the purpose of this study, tourist centers are defined as the villages and towns, listed in the comprehensive Alpine guidebook of the German Automobile Club, that have at least 2,500 guest beds and a ratio of guest beds to permanent population that is greater than 0.2, that is, one guest bed for every five residents.³⁷ Of the 406 communities listed in the guidebook, 154 ranked as tourist centers. Large urban centers such as Innsbruck, Bolzano, and Lucerne are popular destinations but are not classified here as tourist centers because the tourism-intensity ratio is less than 0.2. Although revenue from tourism is important

³⁶ Karl Ruppert, *Der Zweitwohnsitze im Freizeitraum*, *Berichte zur Raumsforschung und Raumplanung*, Vol. 17, 1973, pp. 3–8; and Peter Haimayer, *Freizeitwohnungen in Österreich*, *Mitteilungen des Österreichisches Institut für Raumplanung*, Vol. 6, 1979, pp. 221–246.

³⁷ Das grosse ADAC, footnote 19 above, pp. 212–603.



FIG. 5.—The juxtaposition of a traditional mountain-farming village and a permanent trailer park for seasonal vacationers illustrates cultural incongruity in the Val d'Aosta in northern Italy.

in these cities, the local economy is not overwhelmingly dependent on tourism and related activities.

The distribution of the 154 centers shows distinct regional differences in tourism intensity (Fig. 6). The most striking feature is the very high ratio of tourism intensity in the western part of the Alps. Many centers in the French Alps are intensively developed winter ski resorts built at elevations of 1,800 or more meters in deserted zones well above the valley communities. Although some small villages in this region have skiing facilities that cater to a local or regional clientele, the prototypes of the high-intensity tourist centers are the French stations intégrées and their counterparts in western Switzerland. Les Arcs and La Plagne, which provide rental and condominium accommodations, lack a permanent population and thus have ratios of 10,000 and 7,700 respectively. The ratios for some old resorts are lower because they are at lower elevations and have a resident population. The ratio at Mégève in France is 4.32, at Crans-Montana in Switzerland 6.8.

The large, high-elevation French ski resorts that developed since the 1960s, particularly during the 1970s, were built with capital that came from banks and private corporations based in Paris, Lyons, and other distant urban centers. All were supported by a tourism-planning program of a highly centralized government.³⁸ With a 60 percent increase in the number of guest beds between

³⁸ Rémy Knafou, *L'aménagement du territoire en économie libérale: l'exemple des stations intégrées de sports d'hiver des Alpes françaises*, *Espace Géographique*, No. 3, 1979, pp. 173–180; and P. Florenson, Overall strategies for the implementation of tourism development plans (in France), in *Planning and Development of the Tourist Industry in the ECE Region* (New York: United Nations, Economic Commission for Europe, 1976), pp. 175–180.

1970 and 1975 alone, the stations intégrées dominate winter tourism. Seven stations—Val d'Isère, Tignes, Les Arcs, La Plagne, and Les Trois Vallées (Méribel, Courchevel, and Belleville)—concentrated in the Tarentaise recorded more than 12-million overnight stays in 1975.³⁹ Critics have noted with irony that the stations intégrées are virtually self-sufficient and are not integrated with the local economy or culture.⁴⁰ A unique feature of the recently constructed French ski resorts is the modern urban architectural design imported from the familiar metropolitan milieu of the investors. The high density and the apparently discordant style of these developments have been criticized outside France, but the stations are sufficiently isolated and removed from the traditional valley communities to avoid visual clashes with their styles. Perhaps a more crucial issue is the highly localized environmental and visual effects caused by peak-season use of the sensitive alpine zone: ski lifts, runoff control, and erosion being among the most immediate. The combination of corporate capital, distant investors, and a state-planning mechanism has limited the participation of the valley populations chiefly to unskilled, seasonal occupations.⁴¹ The stations have only restricted multiplier effects, particularly where a strong second season is lacking. The resorts are usually advertised to attract a young clientele seeking snow, sun, and fun, while the local population is cast in a role of socioeconomic inferiority.⁴²

Tourism in eastern Switzerland, northern Italy, Austria, and Bavaria is not concentrated in a few large resorts, and at least 121 tourist centers have a tourism-intensity ratio of 0.2 or more. The average ratio for the eighty-one centers in the Austrian and Bavarian Alps is only 1.15. A small proportion (11 percent) of the tourist centers in the east has a ratio greater than 4 in comparison to 33 percent of those in the west. Only two centers in the eastern part of the Alps are extreme exceptions to the eastern model: Obergurgl (10.00) in Tirol, and Madonna di Campiglio (40.00) in northern Italy.

The development of tourist accommodations in the eastern part of the Alps

³⁹ Louis Chambert and Lucien Chavoutier, *Une vieille vallée épouse son siècle: petite géographie de la Tarentaise* (St. Alban-Leysee: l'Imprimerie Gaillard, 1978), p. 97.

⁴⁰ 27 Principles, footnote 26 above, p. 50.

⁴¹ Chambert and Chavoutier, footnote 39 above, p. 97; and Florenson, footnote 38 above, pp. 175–180.

⁴² Rayna Rapp Reiter, *The politics of tourism in a French alpine community*, in *Hosts and Guests: The Anthropology of Tourism* (edited by Valene E. Smith; Philadelphia: University of Pennsylvania Press, 1977), pp. 139–147, reference on p. 145.

Key for Figure 6 (opposite)
Centers mentioned in text

4	Les Trois Vallées	33	Crans-Montana
10	La Plagne	48	Flims
11	Tignes	54	St. Moritz
12	Val d'Isère	60	Madonna di Campiglio
14	Les Arcs	64	Merano
16	Mégève	85	Sölden
17	St. Gervais	86	Obergurgl, Hochgurgl
20	Chamonix	88	Seefeld
29	Zermatt	101	Kitzbühel
30	Saas-Fee	115	Badgastein
		126	Bad Ischl

A complete key for the figure may be obtained from the author for a period of two years after the publication date of this article.

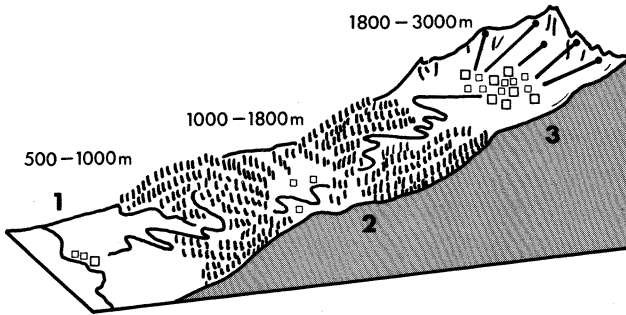


FIG. 7—Model of tourism development in the western Alps.

tends to be in balance with the cultural and economic characteristics of the local population, but tourism-related stress appears when numerous vacation residences surround traditional agricultural communities and then are allowed to proliferate in suburbanlike fashion in the rural landscape. This type of sprawl is partly due to the preference of German-speaking tourists for participation in local culture rather than vacationing in enclaves, and partly due to local autonomy in planning which results in community-based investment initiatives. Where planning controls are weak as in parts of northern Italy, the proliferation of vacation residences has been carried to an extreme.

Differences in the scale, the intensity, and the form of development between the western and eastern models of tourism are reflected in the valley and alpine landscapes. In the western model (Fig. 7) large ski resorts have been erected in the subalpine zone—area 3—long after the local population retreated to the main valley—area 1—where agriculture, forestry, and manufacturing provided employment. The forested zone—area 2—between the valley and the uplands serves as a buffer or barrier separating the valley communities from the ski stations. This landscape model offers a strong contrast with the tourist areas in the eastern Alps where an active pastoral economy coexists with tourism. In the eastern model (Fig. 8) hotels, pensions, and vacation houses arose around the traditional valley communities, many of which have ski and summer-sport facilities—area 1. Above the protective and protected forests overlooking the valleys, the old pasture huts were converted to weekend retreats by villagers who held grazing rights to these lands—area 2. With the spread of development, additional ski runs were cut onto the forested slopes—area 3, and rack railways and gondolas enabled summer tourists to reach the mountain peaks—area 4. In the most intensively developed areas, the forest cover extended toward the valley floor and onto the subalpine meadows as agriculture lost economic importance (Fig. 9). Where communities invested in a summer-skiing project, roads lead through the alpine zone to glaciers on which ski lifts were installed.

As the number and the range of facilities expand in the eastern Alps, the initial positive effects may be replaced by the negative consequences of further growth.⁴³ At first, tourism improves the standard of living of the local popu-

⁴³ Jost Krippendorf, *Die Landschaftsfresser: Tourismus und Erholungslandschaft—Verderben oder Segen?* (Bern: Hallwag Verlag, 1975); and J. Barbier and others, *Stations touristiques de montagne—éléments pour une politique de planification* (Lausanne: Ecole Polytechnique Fédérale, 1974).

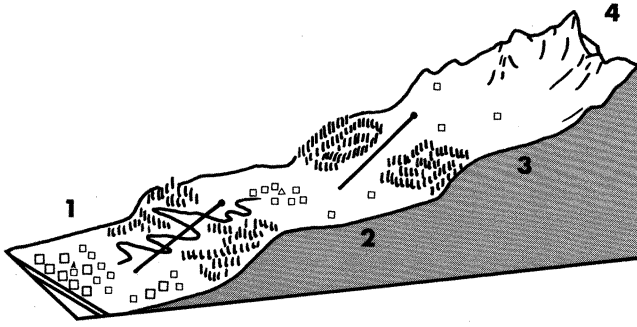


FIG. 8—Model of tourism development in the eastern Alps.

lation because tertiary employment expands and agriculture is intensified in response to increased demands for local foodstuff. The intensity and the volume of tourism in peak season, however, result in an overcommitment of financial resources to tourist accommodations and infrastructure as well as in congestion, suburbanlike sprawl, pollution, and loss of traditional ways of life. Conflicts may also develop among tourism, hydroelectrical installations, and care for the attractive and often advertised cultural landscapes based on mountain agriculture.

The tourism boom has revitalized traditional skills and cultural activities in mountain valleys throughout the Alps. Music, wood carving, and other rural handicrafts have found new practitioners. In general, the regions where mountain agriculture survived have a firm social fabric to absorb the effects of mass tourism. Even in these areas, it is difficult to maintain a delicate balance that avoids both extreme commercialization and a "living museum."⁴⁴ A large influx of visitors changes the approach of the tourist industry from warm hospitality to commercialism. Commercialization and the influx of alien values then threaten the cultural identity of the host community. It is increasingly difficult to find restaurants that serve traditional cuisine in northern Italy because many establishments cater to the preferences of their predominantly German tourist clientele. Many residents feel that their local customs, including festivals that celebrate the seasons in the traditional farming cycle, are being transformed to folklore for outside consumption. Agricultural practices as observed by tourists may not be everything that they seem: one local mayor asked a farmer to drive a flock of sheep through the village every day of the peak tourist season!

Conflicts between the interests of local communities and those of urban-based environmental groups are also increasing. For example, community leaders who want to develop summer glacier skiing in order to supplement inadequate local incomes from agriculture accuse the environmentally concerned opponents of "neocolonialism."⁴⁵ In one specific instance, a national park had been proposed to protect the undeveloped alpine and subalpine landscapes of

⁴⁴ Franz Fliri, *Entwicklung oder Untergang der bergbäuerlichen Kulturlandschaft?*, *Alpenvereins Jahrbuch* 1979, Vol. 104, 1979, pp. 92–103.

⁴⁵ Statement by a local mayor at a public meeting organized by the Austrian and German Alpine clubs to discuss the proposal to establish Hohe Tauern National Park with local residents, Virgen, Austria, October 25, 1980.



FIG. 9—The landscape of Neustift, Tirol, illustrates the features of the eastern model of tourism development. New pensions and a campsite surround the small core of this traditional farming community. The increased emphasis on tourism has resulted in some shift from agriculture, which is manifested in the reforested slopes adjacent to the village.

the Hohe Tauern in Austria that were threatened by stream diversions for hydro-electrical power generation and by a local proposal for a glacier-skiing project.⁴⁶ The mountain-farming population is generally skeptical of groups such as the German and Austrian alpine clubs that propose the development of nonmechanized forms of recreation, for example, hiking and cross-country ski trails, to produce tourist income because they are less damaging to the environment. Some communities resist the perceived threat of becoming living museums in a national park and contest the opponents of glacier-skiing proposals, but the main threat seems to be the proposed stream diversions by provincial hydroelectrical utilities. The solution may not lie in the adoption of the North American concept of national parks that are unintrudable enclaves, but in balancing tourism growth with the traditional mountain agricultural economy and in limiting large-scale technologies, especially hydroelectrical projects, that alter the attractive landscape.

TRADITION AND TOURISM IN THE ÖTZTALER ALPS

The environmental, economic, and social changes wrought by the selective development of tourism are clearly seen in the Ötztaler Alps which straddle the border between Austria and Italy (Fig. 10). This mountainous area experienced

⁴⁶ Anton Draxl, *Zur Geschichte der Nationalparkidee in den Hohe Tauern*, *Nationalpark Hohe Tauern, Berichte-Informationen*, Vol. 1, 1977, pp. 7–11; and H. Kandolf, *Energiewirtschaft und Nationalpark*, *Alpenvereins Jahrbuch*, footnote 44 above, pp. 157–163.

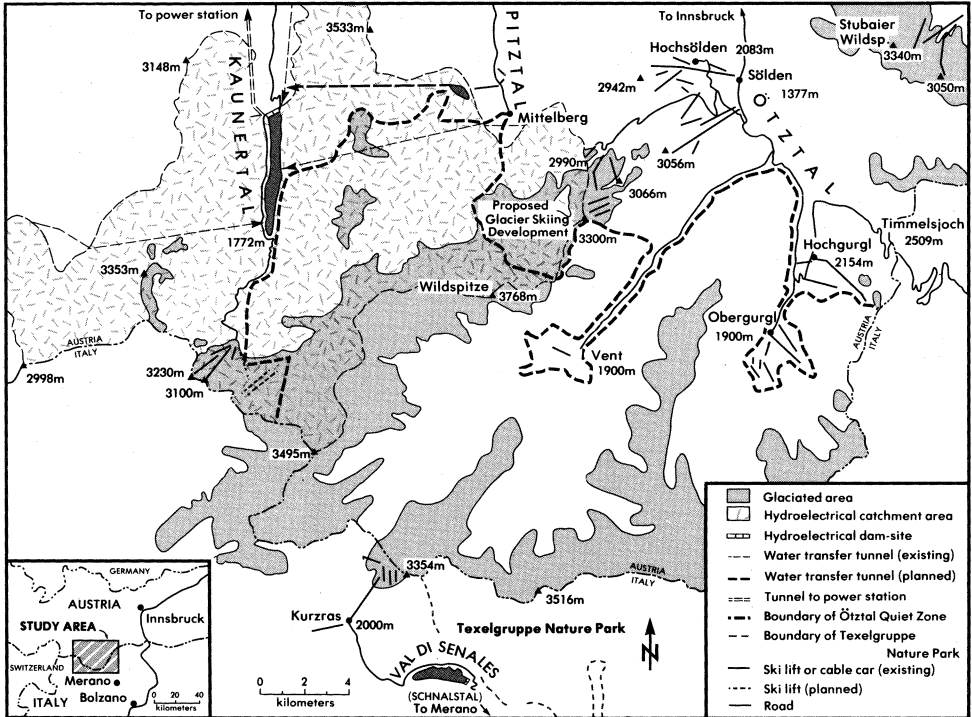


FIG. 10—The Ötztaler Alps.

rural depopulation, commuting to nonagricultural employment, and a shift to more extensive agriculture at least until the 1930s in the four main valleys, Ötztal, Pitztal, Kaunertal, and Val di Senales (Schnalstal). Since then, striking contrasts have emerged among the economies and the landscapes of these valleys. Most communities in the Ötztal have experienced a tourism boom. The upper Kaunertal has been transformed by summer glacier skiing and by a large hydroelectrical reservoir. The rugged and isolated Pitztal remains relatively untouched and is an economically depressed, pastoral enclave. The Val di Senales currently experiences the problems of overinvestment in tourism.

The Pitztal is a narrow valley along which steep slopes with a severe avalanche hazard limit development. Deforestation of the slopes in the nineteenth century, when small agricultural communities shifted to an extensive grazing economy, increased the risks of avalanches and erosion. In the twentieth century, when remote farms were linked to an improved road network, family members began to commute to employment outside the valley. Between 1900 and 1950, more than half of the remaining arable acreage was abandoned, and an attempt to establish cottage industry failed because of the lack of an adequate market. After World War II, a local self-assistance program provided some part-time employment in road improvement, avalanche protection, and flood-control projects.⁴⁷ Less than 2 percent of the upper Pitztal is devoted to crop pro-

⁴⁷ Emil Hensler, *Das Pitztal*, in *Hochwasser- und Lawinenschutz in Tirol* (Innsbruck: Government of Tirol, 1975), pp. 233–240, reference on p. 236.

duction and 23 percent to livestock grazing. Only one-quarter of the farms currently generates self-supporting incomes. There has been some investment in tourist accommodations, half of it in private quarters, but the steep slopes and the rugged terrain impose limits on summer tourism other than the existing mountaineering. Although foreign climbers contributed to the diversification of the economy at the turn of the century by employing local guides and porters, the broadening of the clientele and the shift to independent climbers and hikers currently account for fewer than twenty persons employed as mountain guides. Six mountain huts maintained by the Austrian Alpine Club cater to 20 percent of the winter visitors and 34 percent of the summer clientele in the upper valley. Proposals for a mountaineering school and a glacier-skiing project that would increase the existing tourism-intensity ratio above the current value of 0.8 must take into account competition from the adjacent Kaunertal and Ötztal. Although the direct and indirect revenues from tourism are attractive to the local population, there is risk that the addition of another glacier-skiing development will undermine the economic viability of the facilities in the adjacent valleys.

Additional tourist accommodations have been provided in the Kaunertal because of the recent construction of ski lifts on the glacier at the head of the valley between 2,750 and 3,120 meters. The glacier-skiing facilities were opened in 1980 and catered to 2,000 skiers a day during peak periods in 1981.⁴⁸ As many as 500 cars are driven daily to the base of the glacier. Access to the high glaciers was one consequence of the building of one of the largest Austrian hydroelectrical projects in 1964. The reservoir in Kaunertal supplies a 350–392 megawatt power station that provides electricity for extraregional peak power requirements. The catchment area of the Kaunertal project was tripled to 280 square kilometers by stream capture and tunnel diversions to the reservoir.⁴⁹ A proposal to add an additional 300 megawatts to the capacity by extending the captures raised concerns about the effect of the dry stream beds on landscape values. Agriculture would not be adversely affected by additional stream captures, but the disappearance of waterfalls and rushing mountain torrents has reached such proportions in other Alpine regions that landscape appearance and associated values have been altered. If summer tourism becomes more important in the Kaunertal, proposals to expand hydroelectrical production may become as controversial as those in the Hohe Tauern.

Summer and winter tourism are already important in the Ötztal. Tourism-intensity ratios are high in many small communities: for example, 3.76 in Sölden, 5.00 in Vent, and 10.00 in Obergurgl-Hochgurgl. These ratios contrast with the average of 2.20 for the Kaunertal. Flax was an important crop during the nineteenth century, and in the second half of that century the agricultural economy shifted from an emphasis on grain production to extensive livestock grazing.⁵⁰ Adaptations to the constraints on agriculture at high elevations in

⁴⁸ *Tiroler Tageszeitung*, May 2, 1981, p. 8.

⁴⁹ H. Tschada, Die Nutzung der Wasserkräfte des obersten Pitztales und ihre Auswirkung auf den Wasser- und Geschiebehalt, in *Hochwasser- und Lawinenschutz*, footnote 47 above, pp. 267–277.

⁵⁰ Helmut Heuberger, Das Ötztal, in *Tirol: Ein Geographischer Erkursionsführer*, *Innsbruck Geographische Studien*, Vol. 2 (edited by Franz Fliri and Adolf Leidmair; Innsbruck, 1978), pp. 213–224, reference on p. 218.

the upper Ötztal included out-migration of family members and a ban on marriage in Obergurgl between 1830 and 1850 to maintain the population in the limits set by the carrying capacity of the land.⁵¹

The economic base of the upper valley broadened as Vent and other communities became popular centers for mountain climbing. Road improvements and the construction of mountain huts and climbing trails brought an influx of climbers in the 1860s. Tourism expanded in the 1920s when ski schools were established at Obergurgl, Vent, and Sölden; however, the boom began in the late 1960s with the expansion of ski lifts. Obergurgl grew from a cluster of a dozen farmhouses to a complex of 20 hotels as well as pensions that accommodated 300,000 overnight stays in 1975. The population grew from 130, the limit established in the nineteenth century, to 300 permanent and 600 seasonally employed residents.

New accommodations, for the most part, were built around the existing agricultural communities, although a detached French-style ski resort was constructed at Hochgurgl in 1964. The number of ski lifts in the upper valley between Sölden and Obergurgl increased from 16 in 1974 to 58 in 1979.⁵² Substantial development followed investment in summer glacier skiing above Sölden. As two-season tourism expanded, employment in primary activities, especially agriculture, declined at Sölden from 58 percent in 1951 to 24 percent in 1971. The proportion employed in the tertiary sector increased from 40.9 percent to 62.8 during that interval.⁵³ The physical character of the community changed as the permanent population increased by 26 percent to 2,372. Most of the 6,400 new guest beds were added between 1975 and 1980, but the tendency was to provide commercial hotel accommodations rather than private quarters. The legal limit of ten guest beds per household had been reached by most families. Considerable effort was devoted to the provision of a wide range of attractions for the visitors. In the summer, they included a school of high-alpine mountaineering (one of twenty-one in Tirol), a sports center, guided natural-history hikes, courses on Tyrolean cooking, instruction in the unique Ötztal dialect, demonstrations of traditional Tyrolean agricultural practices, and evenings of traditional musical entertainment. There are plans to expand glacier skiing above Sölden, but concern about the shorter vacation visits of the predominantly West German clientele may preclude their implementation in the near future. There was evidence of shortening length of visits to the upper Ötztal even in 1972; between 1965 and 1972, the average length of winter and summer vacations shrank by 10 percent to 10.5 days and 8.6 days respectively.⁵⁴ There are almost equal numbers of visitors to Sölden in the winter and summer seasons. The summer season is dominant in Obergurgl.

The vulnerability of tourist investments to changing economic characteristics and interests of a foreign clientele is evident in the Val di Senales. The

⁵¹ Walter Moser and Jeannie Peterson, Limits to Obergurgl's growth: an alpine experience in environmental management, *Ambio*, Vol. 10, 1981, pp. 68-72, reference on p. 69.

⁵² Seilbahnen und Lifte in Tirol, Stand 1979-04-0 (Innsbruck: Government of Tirol, 1980), pp. 4-5.

⁵³ Strukturanalyse des Ötztales (Innsbruck: Kammer der Gewerblichen Wirtschaft für Tirol, Wirtschaftsförderungsinstitut, 1976), p. 32.

⁵⁴ Heuberger, footnote 50 above, p. 222.

agricultural practices of this remote Italian valley have long-established links with those of the Ötztal. The same family names are found among the residents of the upper Ötztal and the German-speaking population of the Val di Senales. Every year farmers lead flocks of sheep northward across the glaciers to graze on the mountain pastures in the upper Ötztal. Although mountain agriculture continues to decline, farmers in the Val di Senales still retain these ancient grazing rights. The decision to construct glacier-ski lifts and accommodations at Kurzras led to a reversal of the population decline. The population of the valley increased by 5 percent between 1971 and 1980. The valley has an average tourism-intensity ratio of 1.15, but investors face difficulties in amortizing the costs of underused or unsold hotels and vacation houses. Tourists evidently want more entertainment facilities than are provided at Kurzras, while the local population perceives the presence of visitors as a threat to the traditional culture of the valley.⁵⁵

The strength of the Ötztal approach lies in the local control over economic planning, but it resulted in an increasing number of problems: congestion, fluctuating occupancy rates, and erosion damage.⁵⁶ Local leaders recognize the importance of maintaining agricultural production in order to avoid a monopoly by tourism on the economy.⁵⁷ Concerns about these matters led to the adoption of local and provincial planning measures that had been applied elsewhere in Austria, Switzerland, and Bavaria. Local-zoning controls are used in Obergurgl to prevent construction on remaining open spaces and to restrict vehicular traffic in the village. Many other tourist villages in the Alps have pedestrian zones in the core area. Tertiary sewage treatment is required to solve the problem of pollution in the sensitive subalpine environment. The number of guest beds has been voluntarily reduced. Some pressures associated with summer tourism are being controlled by the creation of an extensive network of hiking trails that, in so far as possible, separate the activities of day visitors and long-term guests. The Tyrolean government imposes strict regulations for the seeding of ski runs in the subalpine zone and pays premiums to farmers who practice approved forms of landscape maintenance. In an effort to avoid problems created by burgeoning vacation houses, the government now prohibits land sales to foreigners in Tirol and restricts the construction of vacation-apartment complexes. In 1981, after long negotiations with local communities and the Austrian Alpine Club, the Tyrolean government designated the central Ötztaler Alps as a Quiet Zone, a new type of conservation unit, established under the Tyrolean Nature Protection Act of 1975.⁵⁸ In a quiet zone, the operation of all noisy equipment, ski lifts, aircraft landings, and the con-

⁵⁵ Peter Sonnewend-Wessenberg, Aus dem Protokoll des Schnalstal-Seminares, *Natur und Land*, Vol. 66, 1980, pp. 200–202.

⁵⁶ A simulation model of Obergurgl's growth has been developed under the auspices of the Austrian Man-and-the-Biosphere Program (MAB 6) and the International Institute for Applied Systems Analysis (IIASA); Obergurgl: development in high mountain regions of Austria, in *Adaptive Environmental Assessment and Management* (edited by C. S. Hollings; New York: John Wiley & Sons, 1978), pp. 215–242.

⁵⁷ Hans Elsasser and Hans Leibundgut, *Touristische Monostrukturen—Probleme im schweizerischen Berggebiet*, *Geographische Rundschau*, Vol. 34, 1982, pp. 228–234.

⁵⁸ Letter from Dr. Martin Dolp, Government of Tirol, Nature Protection Department, December 10, 1981.

struction of public roads are prohibited. Specific activities such as the erection of high-tension power lines require permits, but traditional agricultural activities are unhindered. This innovative provincial legislation is a solution to the problems caused by mechanized forms of recreation but does not interfere with local historical rights and practices.⁵⁹ The restrictions on additional ski projects reflected the lengthy discussions between provincial planners and community leaders on whether a desirable level of tourism investment had been reached. An examination of the boundaries of the Quiet Zone show that leaders in Vent and Obergurgl opted for provincial controls but that the proposed glacier-skiing project in Pitztal was excluded from the conservation unit. The experience gained in the Ötztaler Alps during the next decade should provide information about the limits of tourism development and about the relative merits of strategies to increase community income without incurring long-term, negative socioeconomic and environmental effects.

CONCLUSIONS

The growth of mass tourism in the Alps since the 1950s has economically benefited many communities formerly dependent on noncompetitive mountain agriculture. Two distinct regional models emerged. In the western Alps recent development was concentrated in large ski resorts at high elevations that are isolated from traditional communities. In the eastern Alps, local investment in year-round recreational facilities produced a symbiosis between tourism and traditional mountain agriculture. The vulnerability of a complete reliance on tourism was brought into sharp focus by currency revaluations in 1971 and 1980, the worldwide oil crisis in 1973–74, and the economic recession since 1979. Dependence on an ever-expanding tourist trade as the mainstay of local economies had all the risks of a monopoly. Decision makers were forced to choose between short-term economic gains and a long-term, but less immediately profitable, ecological, economic, and cultural balance. Four valleys in the Ötztaler Alps illustrate the dilemma faced by many Alpine communities: the need to strengthen the economic base of areas bypassed by contemporary trends, and the need to resolve socioeconomic and environmental problems created by summer and winter tourism.

Approaches for resolution of the problems arising from intensive development of the traditional Alpine landscape have been varied. Incentives and subsidies to the traditional mountain farmers whose past practices created the attractive cultural landscapes have achieved the most success in Switzerland and Austria and the least in Italy and France. Integration of local investment initiatives in a regional-planning framework includes the careful design of tourist facilities and infrastructure as well as control of large-scale developments such as hydroelectrical projects and summer glacier skiing above the timberline. Conservation units such as parks, biotype reserves, and quiet zones have been established and maintained in areas with fragile ecosystems.

⁵⁹ Mary L. Barker, Comparison of parks, reserves, and landscape protection in three countries of the Eastern Alps, *Environmental Conservation*, Vol. 9, 1982, (in press).